PHYS552
Topics in Biological Physics

Fall 2019
423 HBH

Instructor: Ching-Hwa Kiang
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Class meetings
The class will meet Tuesday and Thursday from 10:50am to 12:05pm in 423 Herman Brown Hall.

Reference Texts

- Thomas Andrew Waigh, *The Physics of Living Processes*, John Wiley & Sons (2014), ISBN: 9781118449943.
- William Bialek, *Biophysics*, Princeton University Press (2012), ISBN: 9780691138916.

Summary
This course will cover topics of biological physics. Students will learn materials through completing a project on the topic of his/her choice. The basic components of biological systems, such as biomolecules, cells, will be introduced. The physical concepts applying to biological systems, such as polymer physics, molecular and cellular mechanics, and single molecule techniques will be reviewed. Students will work on a project that will be suitable for online presentation throughout the semester.

Important Dates

27	August 2019	First day of class
14–15	October 2019	Midterm recess, no classes
28–29	November 2019	Thanksgiving recess, no classes
5	December 2019	Last day of class

Honor Code
The Rice Honor Code applies.

Homework Policy
Homework assignments will be given every week on Thursday. Homework will be due the following Thursday in the beginning of class. Late homework will not be accepted. You are allowed to collaborate with fellow students on your homework. You may not consult answer keys (from previous years, *etc.*). The homework you turn in must represent your own understanding.

Midterm Report
The midterm report is a short summary report on the topic you chose for your project.

The selected topic must be related to biological physics. Detailed instructions about the term paper will be given later.

Presentation
Each person will give a 45 minute presentation in class. The presentation will be on what you have chosen and done for the project. Detailed instructions about the final presentation will be given later in the semester.

Credit

Homework	40 %
Midterm report	20 %
Presentation	40 %

Tentative Outline of the Course (Learning Objectives)
Building blocks in biological physics
Principles of biological physics
Survey of a variety of topics in biological physics
Identifying a topic of biological physics of interest
Literature search
Writing discussion, conclusion, and summary of a subject

What you will be able to do (Learning Outcomes)
Describe the structure and function of nucleic acids and proteins
Describe the cellular and virus building blocks and functions
Calculate the mechanical properties of biomolecules
Describe single molecule techniques

If you have a documented disability that will impact your work in this class, please contact me to discuss your needs during the first two weeks of class. Additionally, you will need to register with the Disability Support Services Office in the Ley Student Center.